IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application No. 10/728,680	)	**For: ADAPTIVE PILOT ALLOCATION**
Inventors: Fernandez-Corbaton et al.	)	
Examiner: Manoharan	)	
Filed: December 5, 2003	)	**Group No. 2617**

AMENDED APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

A Final Office Action dated November 2, 2007 rejected all pending claims (claims 1, 4-18 and 21-36) in the present application. A Notice of Appeal was submitted on April 1, 2008. An Appeal Brief was filed on May 12, 2008. On May 15, 2008, a Notice of Non-Compliant Appeal Brief was mailed. This Amended Appeal Brief is being submitted in response to the Notice of Non-Compliant Appeal Brief.

CERTIFICATE OF ELECTRONIC TRANSMISSION (37 CFR 1.8)

I hereby certify that this correspondence is being transmitted ELECTRONICALLY to the U.S. Patent and Trademark Office on:

Date: June 13, 2008

Depositor's Name: Margaret Freda

Depositor's Signature: Margaret Freda

TABLE OF CONTENTS

1. REAL PARTY IN INTEREST

The real party in interest is the assignee, QUALCOMM, Inc.

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals and/or interferences.

3. STATUS OF CLAIMS

Claims 1, 4-18 and 21-36 are pending in the present application. Claims 1, 4, 11, 18, 21, 28, and 35-36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0154616 to Aoyama (hereinafter, "Aoyama"). Claims 5-6, 12-13, 22-23 and 29-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoyama in view of U.S. Patent Application Publication No. 2003/0123406 to Yavuz et al. (hereinafter, "Yavuz"). Claims 7-8, 14-15, 24-25 and 31-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoyama in view of International Patent Application Publication No. WO 02/13448 to Farlow (hereinafter, "Farlow"). Claims 9-10, 16-17, 26-27 and 33-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoyama in view of U.S. Patent No. 6,904,081 to Frank (hereinafter, "Frank"). Claims 2-3 and 19-20 have been canceled.

Appellants appeal the above rejections.

4. STATUS OF AMENDMENTS

Subsequent to the final rejection, claim 33 was amended to correct a typographical error. The Advisory Action mailed February 22, 2008 did not indicate whether the amendment of claim 33 was entered. Appellants are assuming that the amendment of claim 33 was entered.

5. SUMMARY OF CLAIMED SUBJECT MATTER

As stated in the background section of Appellants' specification, the objective of a digital communications receiver is to recover the information sent by the transmitter. In most existing systems, the transmitter introduces a reference signal in the waveform together with the data-bearing signals. This reference signal, commonly referred to as a "pilot signal," is known a priori by the receiver and is used to increase the efficiency of the demodulation and decoding processes. It is common practice to broadcast the reference signal; in other words, all receivers will be using the same reference signal in their demodulation algorithms.

Since a part of the waveform is devoted to the transmission of the reference signal, the ceiling on system capacity for data transmission decreases as the amount of the reference signal increases. On the other hand, the receiver performance increases with the amount of the reference signal, which directly results in improved data capacity on given channel conditions.

One characteristic of a communication system that utilizes a reference signal is the tradeoff between the data capacity ceiling and the receiver efficiency that results from varying the portion of the waveform devoted to the transmission of the reference signal. Traditionally, the portion of the waveform devoted to the transmission of the reference signal is fixed and is chosen to be a good compromise, or optimization, between improving the receiver's performance and allocating a sufficient portion of the waveform for data transmission. This optimization is performed taking into account all possible channel conditions, which may vary greatly in propagation scenarios like the cellular environment. This leads to a solution which is good for the average case, but which may be far from optimal in extreme channel conditions.

The present application relates to techniques for improving the overall system capacity for data transmission. As required by 37 C.F.R. § 41.37(c)(1)(v), a summary of claimed subject matter immediately follows. All references are to the specification of the patent application. The references to the specification are not meant to limit the scope of the claims at issue in any way but are only provided because they are mandated by 37 C.F.R. § 41.37(c)(1)(v). The invention is defined by the claims.

1. A base station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal, comprising:

means for receiving a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station in a common reference signal and received by the remote station; (page 8, lines 9-14 (paragraph [0034]); page 9, lines 13-19 (paragraph [0039]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 4, reference nos. 414, 428, 432)

means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station; and (page 8, line 32 - page 9, line 30 (paragraphs [0040]-[0043]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 4, reference nos. 418, 422, 424, 434)

means for transmitting the dedicated reference signal and the traffic signal to the remote station, (page 7, line 27 - page 8, line 8 (paragraphs [0035]-[0036]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 4, reference nos. 418, 422, 426)

wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station. (page 11, lines 4-16 (paragraph [0048]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 5, reference nos. 414', 418', 546)

7. The base station of claim 1, further comprising means for transmitting a parameter e_x to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal. (page 10, lines 21-29 (paragraph [0043]); page 17, line 25 - page 18, line 2 (paragraph [0077]); page 18, lines 9-16 (paragraph [0079]); page 19, line 18 - page 20, line 1 (paragraph [0084]); page 20, lines 4-13 (paragraphs [0086]-[0089]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 4, reference nos. 418, 426)

9. The base station of claim 1, further comprising:

means for computing the coefficients of the L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal; (page 11, lines 4-16 (paragraph [0048]); page 18, line 24 - page 19, line 3 (paragraph [0081]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 4, reference nos. 414, 434)

means for receiving a parameter $\frac{L-1}{n}$ from the remote station. (page 20, lines 7-13 (paragraph [0087]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 4, reference no. 428)

11. A remote station that adaptively allocates of at least one resource between a traffic signal and a dedicated reference signal, comprising:

means for receiving a common reference signal, a dedicated reference signal, and a traffic signal from a base station; (page 10, lines 12-20 (paragraph [0045]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 5, reference nos. 538, 414', 418', 422')

means for determining a quality metric of the received common reference signal; (page 10, line 30 - page 11, line 3 (paragraph [0047]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 5, reference nos. 414', 542, 432)

means for transmitting the quality metric to the base station, wherein the base station uses the quality metric to adaptively allocate a fixed amount of power between the dedicated reference signal and the traffic signal to maximize the capacity for transmitting the traffic signal to the remote station; and (page 8, line 32 - page 9, line 30 (paragraphs [0040]-[0043]); page 10, line 30 - page 11, line 3 (paragraph [0047]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 4, reference nos. 418, 422, 424, 434; Fig. 5, reference nos. 432, 544)

means for using the received common reference signal and the received dedicated reference signal to train a receiver at the remote station. (page 11, lines 4-16 (paragraph [0048]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 5, reference nos. 414', 418', 546)

14. The remote station of claim 11, further comprising means for receiving a parameter e_x from the base station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal. (page 10, lines 21-29 (paragraph [0043]); page 17, line 25 - page 18, line 2 (paragraph [0077]); page 18, lines 9-16 (paragraph [0079]); page 19, line 18 - page 20, line 1 (paragraph [0084]); page 20, lines 4-13 (paragraphs [0086]-[0089]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 5, reference no. 538)

16. The remote station of claim 11, further comprising:

means for computing the coefficients of an L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal; and (page 11, lines 4-16 (paragraph [0048]); page 18, line 24 - page 19, line 3 (paragraph [0081]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 5, reference no. 546)

means for transmitting a parameter $\frac{L-1}{n}$ to the base station. (page 20, lines 4-13 (paragraphs [0086]-[0089]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 5, reference no. 544)

17. The remote station of claim 11, further comprising:

means for computing the coefficients of an L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal; and (page 11, lines 4-16 (paragraph [0048]); page 18, line 24 - page 19, line 3 (paragraph [0081]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 5, reference no. 546)

means for agreeing with the base station about a fixed value for the parameter $\frac{L-1}{n}$. (page 18, lines 9-16 (paragraph [0079]); page 19, line 18 - page 20, line 1 (paragraph [0084]); page 20, lines 4-13 (paragraphs [0086]-[0089]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Figure 5, reference nos. 538, 544)

18. A base station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal, comprising:

a receiver that receives a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station in a common reference signal and received by the remote station; (page 8, lines 9-14 (paragraph [0034]); page 9, lines 13-19 (paragraph [0039]); Fig. 4, reference nos. 414, 428, 432)

a resource allocation component that uses the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station; and (page 8, line 32 - page 9, line 30 (paragraphs [0040]-[0043]); Fig. 4, reference nos. 418, 422, 424, 434)

a transmitter that transmits the traffic signal and the dedicated reference signal to the remote station, (page 7, line 27 - page 8, line 8 (paragraphs [0035]-[0036]); Fig. 4, reference nos. 418, 422, 426)

wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station. (page 11, lines 4-16 (paragraph [0048]); Fig. 5, reference nos. 414', 418', 546)

28. A remote station configured to facilitate adaptive allocation of at least one resource between a traffic signal and a dedicated reference signal, the remote station comprising:

a receiver that receives a common reference signal, a dedicated reference signal, and a traffic signal from a base station; (page 10, lines 12-20 (paragraph [0045]); Fig. 5, reference nos. 538, 414', 418', 422')

a signal quality measurement component that determines a quality metric of the received common reference signal; (page 10, line 30 - page 11, line 3 (paragraph [0047]); page 21, lines 10-32 (paragraphs [0091]-[0092]); Fig. 5, reference nos. 414', 542, 432)

a transmitter that transmits the quality metric to the base station, wherein the base station uses the quality metric to adaptively allocate a fixed amount of power between the dedicated reference signal and the traffic signal to maximize the capacity to transmit the traffic signal to the remote station; and (page 8, line 32 - page 9, line 30 (paragraphs [0040]-[0043]); page 10, line 30 - page 11, line 3 (paragraph [0047]); Fig. 4, reference nos. 418, 422, 424, 434; Fig. 5, reference nos. 432, 544)

a training component that uses the received common reference signal and the received dedicated reference signal to train the receiver. (page 11, lines 4-16 (paragraph [0048]); Fig. 5, reference nos. 414', 418', 546)

35. In a base station, a method for adaptively allocating at least one resource between a traffic signal and a dedicated reference signal, comprising:

receiving a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station in a common reference signal and received by the remote station; (page 8, lines 9-14 (paragraph [0034]); page 9, lines 13-19 (paragraph [0039]); Fig. 4, reference nos. 414, 428, 432; Fig. 10, reference no. 1008)

using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station; and (page 8, line 32 - page 9, line 30 (paragraphs [0040]-[0043]); Fig. 4, reference nos. 418, 422, 424, 434; Fig. 10, reference no. 1010)

transmitting the dedicated reference signal and the traffic signal to the remote station, (paragraphs [0035]-[0036]); Fig. 4, reference nos. 418, 422, 426; Fig. 10, reference no. 1012)

wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station. (page 11, lines 4-16 (paragraph [0048]); Fig. 5, reference nos. 414', 418', 546)

36. In a remote station, a method for facilitating adaptive allocation of at least one resource between a traffic signal and a dedicated reference signal, comprising:

receiving a common reference signal, a dedicated reference signal, and a traffic signal from a base station; (page 10, lines 12-20 (paragraph [0045]); Fig. 5, reference nos. 538, 414', 418', 422'; Fig. 10, reference nos. 1002, 1004, 1012)

determining a quality metric of the received common reference signal; (page 10, line 30 - page 11, line 3 (paragraph [0047]); Fig. 5, reference nos. 414', 542, 432; Fig. 10, reference no. 1006)

transmitting the quality metric to the base station, wherein the base station uses the quality metric to adaptively allocate a fixed amount of power between the dedicated reference signal and the traffic signal to maximize the capacity for transmitting the traffic signal to the remote station; and (page 8, line 32 - page 9, line 30 (paragraphs [0040]-[0043]); page 10, line 30 - page 11, line 3 (paragraph [0047]); Fig. 4, reference nos. 418, 422, 424, 434; Fig. 5, reference nos. 432, 544; Fig. 10, reference nos. 1008, 1010)

using the received common reference signal and the received dedicated reference signal to train a receiver at the remote station. (page 11, lines 4-16 (paragraph [0048]); Fig. 5, reference nos. 414', 418', 546)

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following issues are presented for review:

A. Whether claims 1, 4, 11, 18, 21, 28 and 35-36 are unpatentable under 35 U.S.C. § 102(b) over Aoyama.

B. Whether claims 5-6, 12-13, 22-23 and 29-30 are unpatentable under 35 U.S.C. § 103(a) over Aoyama in view of Yavuz.

C. Whether claims 7-8, 14-15, 24-25 and 31-32 are unpatentable under 35 U.S.C. § 103(a) over Aoyama in view of Farlow.

D. Whether claims 9-10, 16-17, 26-27 and 33-34 are unpatentable under 35 U.S.C. § 103(a) over Aoyama in view of Frank.

7. ARGUMENT

A. Claims 1, 4, 11, 18, 21, 28 and 35-36 Rejected under 35 U.S.C. § 102(b)

Claims 1, 4, 11, 18, 21, 28 and 35-36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Aoyama. Appellants respectfully traverse.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP § 2131 (citing Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). "The identical invention must be shown in as complete detail as is contained in the ... claim." Id. (citing Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). In addition, "the reference must be enabling and describe the applicant's claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention." In re Paulsen, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994).

Claims 1, 4, 18, 21, and 35

Claim 1 is directed to a "base station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal." Claim 1 recites "means for receiving a quality metric from a remote station," and "means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal." Appellants respectfully submit that Aoyama does not disclose this claimed subject matter.

Aoyama states the following:

> It is an object of the present invention to provide a base station apparatus, communication terminal apparatus, and communication method that enable data-part reception quality to be maintained even when phase changes are sudden with HDR.
>
> This object is achieved by transmitting a dedicated pilot signal using one of the codes used for data transmission when data is transmitted from a base station apparatus to a specific communication terminal using a plurality of spreading codes.

(Aoyama, paragraphs [0013]-[0014].)

Figure 12 of Aoyama "show[s] the configuration of a base station apparatus 800." (Aoyama, paragraph [0140].) The "base station apparatus 800" includes a "reception level measurement section 801 ... for each communication terminal apparatus with which radio communication is performed." (Id., paragraph [0144].) Aoyama states:

> Each reception level measurement section 801 measures the reception level from a signal spread by a despreading section 104, and determines the state of the propagation environment. The reception level measurement section 801 then outputs a signal indicating the state of the propagation environment for the communication terminal apparatus to which data is to be transmitted....

(Id.)

The "base station apparatus 800" also includes a "power ratio controller 802." (Aoyama, paragraph [0145].) Aoyama states:

> The power ratio controller 802 controls the transmission power ratio between spread transmit data and a spread dedicated pilot signal in accordance with the state of the propagation environment. For example, when the state of the propagation environment is good, the communication terminal apparatus can perform a path search and channel fluctuation estimation without having a dedicated pilot signal transmitted at high power, and therefore the transmission power of the dedicated pilot signal is weak, and the data transmission power is increased compared with the dedicated pilot signal transmission power.

(Id.)

Aoyama does not disclose "using the quality metric" that is "receiv[ed] ... from a remote station" to "adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal," as recited in claim 1. The Examiner may be asserting that the "signal indicating the state of the propagation environment" in Aoyama corresponds to the "quality metric" recited in claim 1. However, the "signal indicating the state of the propagation environment" does not possess all of the characteristics of the "quality metric" that are set forth in claim 1. For example, the "signal indicating the state of the propagation environment" in Aoyama does not "indicate[] the quality of a signal transmitted from the base station in a common reference signal and received by the remote station," as recited in claim 1.

Moreover, Aoyama indicates that the "reception level measurement section 801 ... determines the state of the propagation environment." (Id., paragraph [0144].) The "reception

level measurement section 801" is part of the "base station apparatus 800." (See Aoyama, paragraphs [0140]-[0144]; Figure 12.) Thus, in Aoyama, it is the "base station apparatus 800" that "determines the state of the propagation environment." This is in direct contrast to claim 1, which recites that the "base station … receiv[es] a quality metric from a remote station."

The Examiner refers to paragraph [0077] of Aoyama. This portion of Aoyama states:

> Then, in the channel estimation section 208, channel fluctuation is estimated using the common pilot signal and dedicated pilot signal, and in the demodulation section 209, the output signal of despreading section 206 is demodulated taking account of channel fluctuation. Also, the CIR is calculated for the common pilot signal by the CIR measurement section 251, and, based on the CIR, the transmission rate at which communication is possible at the desired quality is calculated by the channel estimation section 352.

(Aoyama, paragraph [0077].) Thus, this portion of Aoyama refers to a "CIR," which stands for "Carrier to Interference Ratio." (See Aoyama, paragraph [0007].) The Examiner appears to be asserting that the "CIR" is a "quality metric" within the meaning of claim 1. Even if this assertion is correct, Aoyama does not disclose "using the [CIR] to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal," as recited in claim 1. Claim 1 does not merely recite a "quality metric"; rather, claim 1 recites "means for receiving a quality metric from a remote station" and "means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal." Aoyama does not disclose this claimed subject matter.

The Examiner refers to paragraph [0139] of Aoyama. (See Advisory Action mailed February 22, 2008, page 2.) This portion of Aoyama states, in pertinent part: "[T]he transmission power ratio between code-multiplexed transmit data and a dedicated pilot signal is controlled in accordance with the propagation environment." (Aoyama, paragraph [0139].) Thus, this portion of Aoyama refers generally to controlling the transmission power ratio based on the "propagation environment." However, Aoyama does not disclose the specific subject matter that is recited in claim 1, namely that the "base station" uses a "quality metric" that is "receiv[ed] … from a remote station" to control the transmission power ratio.

The Examiner also refers to paragraphs [0063]-[0066] of Aoyama. (See Advisory Action mailed February 22, 2008, pages 3-4.) However, for at least the reasons provided below, this cited portion of Aoyama does not disclose the claimed subject matter at issue.

The cited portion of Aoyama states: "The DRC signal is ... transmitted to the base station apparatus 100 as a radio signal from the antenna 201 via the transmit/receive duplexer 202." (Aoyama, paragraph [0064].) Thus, Aoyama indicates that a communication terminal apparatus 200 transmits a DRC signal to the base station apparatus 100. However, the DRC signal referred to by Aoyama is not a "quality metric" as recited in claim 1. The DRC signal referred to by Aoyama does not "indicate[] the quality of a signal transmitted from the base station in a common reference signal and received by the remote station," as recited in claim 1. Rather, the DRC signal indicates the "transmission rate at which communication is possible at the desired quality." (See Aoyama, paragraph [0063].)

The cited portion of Aoyama also states: "[B]ased on the CIR, the transmission rate at which communication is possible at the desired quality is calculated by the transmission rate calculation section 252. A DRC signal indicating the relevant transmission rate is then generated by the DRC signal creation section 253." (Aoyama, paragraph [0063].) Thus, Aoyama indicates that the DRC signal indicates the transmission rate, and that the transmission rate is calculated based on the CIR. However, the DRC signal itself is not a "quality metric" as recited in claim 1. The DRC signal referred to by Aoyama does not "indicate[] the quality of a signal transmitted from the base station in a common reference signal and received by the remote station," as recited in claim 1.

The cited portion of Aoyama also states: "[C]ommunication resource allocation to each communication terminal apparatus 200 is determined by the transmission destination determination section 106 based on the DRC signal...." (Aoyama, paragraph [0066].) As discussed above, the DRC signal is not a "quality metric" as recited in claim 1. However, even if the DRC signal were interpreted as a "quality metric" (which is not conceded), Aoyama's general reference to "communication resource allocation" does not disclose the specific subject matter recited in claim 1, namely "using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal."

In view of the foregoing, Appellants respectfully submit that claim 1 is allowable. Accordingly, Appellants respectfully request that the Examiner's rejection of claim 1 be reversed.

Claim 4 depends from claim 1. Claims 18 and 35 include subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Claim 21 depends from claim 18. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 4, 18, 21, and 35 be reversed for at least the same reasons as those presented above in relation to claim 1.

Claims 11, 28, and 36

Claim 11 is directed to a "remote station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal." Claim 11 recites "means for determining a quality metric of the received common reference signal," and "means for transmitting the quality metric to the base station, wherein the base station uses the quality metric to adaptively allocate a fixed amount of power between the dedicated reference signal and the traffic signal." Appellants respectfully submit that Aoyama does not disclose this claimed subject matter.

As indicated above, Aoyama describes a "base station apparatus 800" that includes a "reception level measurement section 801." (Aoyama, paragraphs [0140], [0144].) Aoyama states that "[e]ach reception level measurement section 801 ... determines the state of the propagation environment ... [and] outputs a signal indicating the state of the propagation environment...." (Id.) However, as discussed above, the "signal indicating the state of the propagation environment" in Aoyama is not a "quality metric," because the "signal indicating the state of the propagation environment" in Aoyama does not "indicate[] the quality of a signal transmitted from the base station in a common reference signal and received by the remote station," as recited in claim 11. Moreover, in Aoyama it is the "base station apparatus 800" that "determines the state of the propagation environment." This is in direct contrast to claim 11, which recites that the "remote station ... determin[es] a quality metric of the received common reference signal" and "transmit[s] the quality metric to the base station."

In view of the foregoing, Appellants respectfully submit that claim 11 is allowable. Accordingly, Appellants respectfully request that the Examiner's rejection of claim 11 be reversed.

Claims 28 and 36 include subject matter that is similar to the subject matter that was discussed above in relation to claim 11. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 28 and 36 be reversed for at least the same reasons as those presented above in relation to claim 11.

B. Claims 5-6, 12-13, 22-23 and 29-30 Rejected under 35 U.S.C. § 103(a)

Claims 5-6, 12-13, 22-23 and 29-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoyama in view of Yavuz. Appellants respectfully traverse.

Claims 5-6 and 22-23

Claims 5-6 depend from claim 1. Claims 22-23 depend from claim 18, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 5-6 and 22-23 be reversed for at least the same reasons as those presented above in relation to claim 1.

Claims 12-13 and 29-30

Claims 12-13 depend from claim 11. Claims 29-30 depend from claim 28, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 11. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 12-13 and 29-30 be reversed for at least the same reasons as those presented above in relation to claim 11.

C. Claims 7-8, 14-15, 24-25 and 31-32 Rejected under 35 U.S.C. § 103(a)

Claims 7-8, 14-15, 24-25 and 31-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoyama in view of Farlow. Appellants respectfully traverse.

Claims 7 and 24

Claim 7 depends from claim 1. Claim 24 depends from claim 18, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 7 and 24 be reversed for at least the same reasons as those presented above in relation to claim 1.

In addition, Appellants present the following additional reasons why claims 7 and 24 are allowable. Claim 7 recites "means for transmitting a parameter e_x to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal." Claim 24 recites that "the transmitter also transmits a parameter e_x to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal." Appellants respectfully submit that the cited references do not teach or suggest this claimed subject matter.

The Examiner correctly acknowledges that Aoyama does not teach or suggest this claimed subject matter. (See Office Action mailed November 2, 2007, page 5.) However, the Examiner asserts that this claimed subject matter is taught by page 10, lines 20-25 of Farlow. (See id.) Appellants respectfully disagree.

The cited portion of Farlow states:

> In one embodiment, command generation module 418 generates commands for a remote unit to establish values for parameters that control the selective insertion of training sequences in at least one subsequent time slot. For example, command generation module 418, in one embodiment, generates values for at least one of a training sequence offset, a training sequence interval, and a training sequence length parameter to control the insertion of training sequences.

(Farlow, page 10, lines 20-25.) Thus, the cited portion of Farlow refers to "generat[ing] commands for a remote unit to establish values for parameters." However, the "parameters" referred to by Farlow do not "represent[] the portion of the resource allocated to the dedicated reference signal," as recited in claims 7 and 24. Rather, the "parameters" referred to by Farlow "control the selective insertion of training sequences in at least one subsequent time slot." (Farlow, page 10, lines 21-22.) "[P]arameters" that "control the selective insertion of training sequences" are not the same as a "parameter e_x [that] represents the portion of the resource allocated to the dedicated reference signal," as recited in claims 7 and 24.

The Examiner asserts that "this modification is a necessity [rather] than an inventive step. This is because, the length of the reference signal changes that information has to be informed to the receiver to process the signal." (Office Action mailed November 2, 2007, page 5.) Appellants respectfully disagree. It is not necessary that the "base station ... transmit[s] a parameter e_x to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal," as recited in claims 7 and 24. For example, as one possible alternative to what is claimed, the base station and the remote station may agree on some implicit rules for determining the parameter e_x.

The Examiner also refers to paragraph [0139] of Aoyama. (See Advisory Action mailed February 22, 2008, page 5.) The cited portion of Aoyama states that the "total transmission power is fixed in HDR" and that "the transmission power ratio between code-multiplexed transmit data and a dedicated pilot signal is controlled in accordance with the propagation environment." (Aoyama, paragraph [0139].) However, this portion of Aoyama does not have anything to do with transmitting any type of "parameter ... to the remote station," let alone a "parameter ... represent[ing] the portion of the resource allocated to the dedicated reference signal," as recited in claims 7 and 24.

In view of the foregoing, Appellants respectfully submit that claims 7 and 24 are allowable. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 7 and 24 be reversed.

Claims 8 and 25

Claim 8 depends from claim 1. Claim 25 depends from claim 18, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 8 and 25 be reversed for at least the same reasons as those presented above in relation to claim 1.

Claims 14 and 31

Claim 14 depends from claim 11. Claim 31 depends from claim 28, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 11. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 14 and 31 be reversed for at least the same reasons as those presented above in relation to claim 11.

Appellants also present the following additional reasons why claims 14 and 31 are allowable. Claim 14 recites "means for receiving a parameter e_x from the base station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal." Claim 31 recites that "the receiver also receives a parameter e_x from the base station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal." Appellants respectfully submit that the cited references do not teach or suggest this claimed subject matter.

The Examiner correctly acknowledges that Aoyama does not teach or suggest this claimed subject matter. (See Office Action mailed November 2, 2007, page 5.) However, the Examiner asserts that this claimed subject matter is taught by page 10, lines 20-25 of Farlow. (See id.) Appellants respectfully disagree. As discussed above, the cited portion of Farlow refers to "generat[ing] commands for a remote unit to establish values for parameters." However, the "parameters" referred to by Farlow do not "represent[] the portion of the resource allocated to the dedicated reference signal," as recited in claims 14 and 31. Rather, the "parameters" referred to by Farlow "control the selective insertion of training sequences in at least one subsequent time slot." (Farlow, page 10, lines 21-22.)

In addition, as discussed above, Appellants respectfully disagree with the Examiner's assertion that "this modification is a necessity." (Office Action mailed November 2, 2007, page 5.) It is not necessary that the "remote station ... receive[s] a parameter e_x from the base station,

wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal," as recited in claims 14 and 31. For example, the base station and the remote station may agree on some implicit rules for determining the parameter e_x.

In view of the foregoing, Appellants respectfully submit that claims 14 and 31 are allowable. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 14 and 31 be reversed.

Claims 15 and 32

Claim 15 depends from claim 11. Claim 32 depends from claim 28, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 11. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 15 and 32 be reversed for at least the same reasons as those presented above in relation to claim 11.

D. Claims 9-10, 16-17, 26-27 and 33-34 Rejected under 35 U.S.C. § 103(a)

Claims 9-10, 16-17, 26-27 and 33-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoyama in view of Frank. Appellants respectfully traverse.

Claims 9 and 26

Claim 9 depends from claim 1. Claim 26 depends from claim 18, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 9 and 26 be reversed for at least the same reasons as those presented above in relation to claim 1.

In addition, Appellants present the following additional reasons why claims 9 and 26 are allowable. Claim 9 recites "means for computing the coefficients of the L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal." Claim 9 also recites "means for receiving a parameter $\frac{L-1}{n}$ from the remote station." Claim 26 recites that "a training component at the remote station employs a least squares estimation method over

n chips of the common reference signal to compute the coefficients of an L-tap linear equalizer." Claim 26 also recites that "the receiver also receives a parameter $\frac{L-1}{n}$ from the remote station." Appellants respectfully submit that the cited references do not teach or suggest this claimed subject matter.

The Examiner correctly acknowledges that Aoyama does not teach or suggest this claimed subject matter. (See Office Action mailed November 2, 2007, pages 6, 8-9.) However, the Examiner asserts that this claimed subject matter is taught by col. 4, lines 34-59 of Frank. (See id.) Appellants respectfully disagree.

The cited portion of Frank states:

> Referring to FIG. 3, a receiver 300 includes shift register 302, correlator 304, a filter 306, a matched filter 308, an adaptive MMSE equalizer 310 and an adaptation algorithm process 312. A received, preconditioned signal 314 is sampled at a suitable integer multiple n of the chip rate, such as twice the chip rate, and shifted into the shift register 302 n samples at a time. Each of the n samples (not individually identified) from the shift register 302 is despread using the spreading sequence by a despreader 316 to provide n respective despread samples 318. The despread samples are then respectively correlated within correlator 304 to provide a correlation vector x^k, having elements x^k_1, x^k_2, ... , x^k_L, where L is the number of equalizer taps. The correlation vector x^k is provided to the adaptation algorithm 312, which generates the coefficients f^k, having elements f^k_1, f^k_2, ... , f^k_L, for MMSE equalizer 310. The coefficients f^k may be determined using a least mean square "LMS", recursive least square "RLS", or multi-stage Weiner adaptation, and as described in the afore-mentioned U.S. Pat. No. 6,175,588 they are a function of the correlation vector x^k and the error signal e^k, described below. The coefficients f^k may be updated every N chips, or as otherwise suitably determined. Other suitable adaptation algorithms may be employed depending on the desired output of the MMSE equalizer 310.

(Frank, col. 4, lines 34-59.) Thus, the cited portion of Frank refers to sampling a "received, preconditioned signal 314 ... at a suitable integer multiple n of the chip rate." The cited portion of Frank also refers to "L ... equalizer taps." The cited portion of Frank also refers to "determin[ing]" "[t]he coefficients fk ... for MMSE equalizer" "using a least mean square" method.

However, the cited portion of Frank does not teach or suggest that the parameter $\frac{L-1}{n}$ is "receiv[ed] ... from the remote station," as recited in claims 9 and 26. Although Frank refers to sampling a signal at "a ... multiple n of the chip rate" and also to "L ... equalizer taps," Appellants cannot find any part of Frank which teaches or suggests how n or L are determined. Frank certainly does not teach or suggest "receiv[ing] ... $\frac{L-1}{n}$ from the remote station," as recited in claims 9 and 26.

The Examiner also refers to paragraph [0139] of Aoyama. (See Advisory Action mailed February 22, 2008, page 6.) The cited portion of Aoyama states that the "total transmission power is fixed in HDR" and that "the transmission power ratio between code-multiplexed transmit data and a dedicated pilot signal is controlled in accordance with the propagation environment." (Aoyama, paragraph [0139].) However, this portion of Aoyama does not have anything to do with receiving any type of "parameter ... from the remote station," let alone a "parameter $\frac{L-1}{n}$," as recited in claims 9 and 26.

In view of the foregoing, Appellants respectfully submit that claims 9 and 26 are allowable. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 9 and 26 be reversed.

Claims 10 and 27

Claim 10 depends from claim 1. Claim 27 depends from claim 18, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 1. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 10 and 27 be reversed for at least the same reasons as those presented above in relation to claim 1.

Claims 16 and 33

Claim 16 depends from claim 11. Claim 33 depends from claim 28, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim

11. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 16 and 33 be reversed for at least the same reasons as those presented above in relation to claim 11.

In addition, Appellants present the following additional reasons why claims 16 and 33 are allowable. Claim 16 recites "means for computing the coefficients of an L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal." Claim 16 also recites "means for transmitting a parameter $\frac{L-1}{n}$ to the base station." Claim 33 recites that "the training component uses a least squares estimation method over n chips of the common reference signal to compute the coefficients of an L-tap linear equalizer." Claim 33 also recites that "the transmitter also transmits a parameter $\frac{L-1}{n}$ to the base station." Appellants respectfully submit that the cited references do not teach or suggest this claimed subject matter.

The Examiner correctly acknowledges that Aoyama does not teach or suggest this claimed subject matter. (See Office Action mailed November 2, 2007, pages 7-8, 10.) However, the Examiner asserts that this claimed subject matter is taught by col. 4, lines 34-59 of Frank. (See id.) Appellants respectfully disagree. As discussed above, the cited portion of Frank does not teach or suggest that the parameter $\frac{L-1}{n}$ is "transmit[ted] ... to the base station," as recited in claims 16 and 33. Although Frank refers to sampling a signal at "a ... multiple n of the chip rate" and Frank also refers to "L ... equalizer taps," Appellants cannot find any part of Frank which teaches or suggests how n or L are determined. Frank certainly does not teach or suggest a "remote station" "transmit[ting] ... $\frac{L-1}{n}$ to the base station," as recited in claims 16 and 33.

In view of the foregoing, Appellants respectfully submit that claims 16 and 33 are allowable. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 16 and 33 be reversed.

<u>Claims 17 and 34</u>

Claim 17 depends from claim 11. Claim 34 depends from claim 28, which includes subject matter that is similar to the subject matter that was discussed above in relation to claim 11. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 17 and 34 be reversed for at least the same reasons as those presented above in relation to claim 11.

In addition, Appellants present the following additional reasons why claims 17 and 34 are allowable. Claim 17 recites "means for computing the coefficients of an L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal." Claim 17 also recites "means for agreeing with the base station about a fixed value for the parameter $\frac{L-1}{n}$." Claim 34 recites that "the training component uses a least squares estimation method over n chips of the common reference signal to compute the coefficients of an L-tap linear equalizer." Claim 34 also recites that "the remote station is configured to agree with the base station about a fixed value for the parameter $\frac{L-1}{n}$." Appellants respectfully submit that the cited references do not teach or suggest this claimed subject matter.

The Examiner correctly acknowledges that Aoyama does not teach or suggest this claimed subject matter. (See Office Action mailed November 2, 2007, pages 8, 10-11.) However, the Examiner asserts that this claimed subject matter is taught by col. 4, lines 34-59 of Frank. (See id.) Appellants respectfully disagree. As discussed above, the cited portion of Frank does not teach or suggest that the "remote station ... agree[s] with the base station about a fixed value for the parameter $\frac{L-1}{n}$," as recited in claim 17. Frank also does not teach or suggest that "the remote station is configured to agree with the base station about a fixed value for the parameter $\frac{L-1}{n}$," as recited in claim 34. Although Frank refers to sampling a signal at "a ... multiple n of the chip rate" and Frank also refers to "L ... equalizer taps," Appellants cannot find any part of Frank which teaches or suggests how n or L are determined. Frank certainly does not teach or suggest a "remote station" and a "base station" "agree[ing] ... about a fixed value for the parameter $\frac{L-1}{n}$," as recited in claims 17 and 34.

In view of the foregoing, Appellants respectfully submit that claims 17 and 34 are allowable. Accordingly, Appellants respectfully request that the Examiner's rejection of claims 17 and 34 be reversed.

Respectfully submitted,

Dated: 6/13/08

By: D Scott 39,243 for Eric Ho, Reg. No. 39,711
(858) 658-2752

QUALCOMM Incorporated
5775 Morehouse Drive
San Diego, California 92121
Telephone: (858) 651-4125
Facsimile: (858) 658-2502

CLAIMS APPENDIX

Listing of Claims involved in the appeal:

1. A base station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal, comprising:

means for receiving a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station in a common reference signal and received by the remote station;

means for using the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station; and

means for transmitting the dedicated reference signal and the traffic signal to the remote station,

wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station.

4. The base station of claim 1, further comprising means for transmitting a common reference signal to the remote station and to a plurality of other remote stations.

5. The base station of claim 4, wherein the quality metric comprises a signal-to-interference-and-noise ratio of the common reference signal received at the remote station.

6. The base station of claim 4, wherein the quality metric comprises a symbol error rate of the common reference signal received at the remote station.

7. The base station of claim 1, further comprising means for transmitting a parameter e_x to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal.

8. The base station of claim 1, further comprising means for receiving a parameter θ from the remote station,

wherein the parameter $\theta \equiv \frac{L-1}{n}$.

9. The base station of claim 1, further comprising:

means for computing the coefficients of the L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal;

means for receiving a parameter $\frac{L-1}{n}$ from the remote station.

10. The base station of claim 1, further comprising:

means for computing the coefficients of an L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal; and

means for agreeing with the remote station about a fixed value for the parameter $\frac{L-1}{n}$.

11. A remote station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal, comprising:

means for receiving a common reference signal, a dedicated reference signal, and a traffic signal from a base station;

means for determining a quality metric of the received common reference signal;

means for transmitting the quality metric to the base station, wherein the base station uses the quality metric to adaptively allocate a fixed amount of power between the dedicated reference signal and the traffic signal to maximize the capacity for transmitting the traffic signal to the remote station; and

means for using the received common reference signal and the received dedicated reference signal to train a receiver at the remote station.

12. The remote station of claim 11, wherein the quality metric comprises a signal-to-interference-and-noise ratio of the received common reference signal.

13. The remote station of claim 11, wherein the quality metric comprises a symbol error rate of the received common reference signal.

14. The remote station of claim 11, further comprising means for receiving a parameter e_x from the base station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal.

15. The remote station of claim 11, further comprising means for transmitting a parameter θ to the base station,

wherein the parameter $\theta \equiv \frac{L-1}{n}$.

16. The remote station of claim 11, further comprising:

means for computing the coefficients of an L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal; and

means for transmitting a parameter $\frac{L-1}{n}$ to the base station.

17. The remote station of claim 11, further comprising:

means for computing the coefficients of an L-tap linear equalizer using a least squares estimation method over n chips of the common reference signal; and

means for agreeing with the base station about a fixed value for the parameter $\frac{L-1}{n}$.

18. A base station that adaptively allocates at least one resource between a traffic signal and a dedicated reference signal, comprising:

a receiver that receives a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station in a common reference signal and received by the remote station;

a resource allocation component that uses the quality metric to adaptively allocate a fixed amount of power between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station; and

a transmitter that transmits the traffic signal and the dedicated reference signal to the remote station,

wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station.

21. The base station of claim 18, wherein the transmitter is further configured to transmit a common reference signal to the remote station and to a plurality of other remote stations.

22. The base station of claim 21, wherein the quality metric comprises a signal-to-interference-and-noise ratio of the common reference signal received at the remote station.

23. The base station of claim 21, wherein the quality metric comprises a symbol error rate of the common reference signal received at the remote station.

24. The base station of claim 18, wherein the transmitter also transmits a parameter e_x to the remote station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal.

25. The base station of claim 18, wherein the receiver also receives a parameter θ from the remote station, and

wherein the parameter $\theta \equiv \frac{L-1}{n}$.

26. The base station of claim 18, wherein a training component at the remote station employs a least squares estimation method over n chips of the common reference signal to compute the coefficients of an L-tap linear equalizer, and wherein the receiver also receives a parameter $\frac{L-1}{n}$ from the remote station.

27. The base station of claim 18, wherein a training component at the remote station employs a least squares estimation method over n chips of the common reference signal to compute the coefficients of an L-tap linear equalizer, and wherein the base station is configured to agree with the remote station about a fixed value for the parameter $\frac{L-1}{n}$.

28. A remote station configured to facilitate adaptive allocation of at least one resource between a traffic signal and a dedicated reference signal, the remote station comprising:

a receiver that receives a common reference signal, a dedicated reference signal, and a traffic signal from a base station;

a signal quality measurement component that determines a quality metric of the received common reference signal;

a transmitter that transmits the quality metric to the base station, wherein the base station uses the quality metric to adaptively allocate a fixed amount of power between the dedicated reference signal and the traffic signal to maximize the capacity to transmit the traffic signal to the remote station; and

a training component that uses the received common reference signal and the received dedicated reference signal to train the receiver.

29. The remote station of claim 28, wherein the quality metric comprises a signal-to-interference-and-noise ratio of the received common reference signal.

30. The remote station of claim 28, wherein the quality metric comprises a symbol error rate of the received common reference signal.

31. The remote station of claim 28, wherein the receiver also receives a parameter e_x from the base station, wherein the parameter e_x represents the portion of the resource allocated to the dedicated reference signal.

32. The remote station of claim 28, wherein the transmitter also transmits a parameter θ to the base station, and

wherein the parameter $\theta \equiv \frac{L-1}{n}$.

33. The remote station of claim 28, wherein the training component uses a least squares estimation method over n chips of the common reference signal to compute the coefficients of an L-tap linear equalizer, and wherein the transmitter also transmits a parameter $\frac{L-1}{n}$ to the base station.

34. The remote station of claim 28, wherein the training component uses a least squares estimation method over n chips of the common reference signal to compute the coefficients of an L-tap linear equalizer, and wherein the remote station is configured to agree with the base station about a fixed value for the parameter $\frac{L-1}{n}$.

35. In a base station, a method for adaptively allocating at least one resource between a traffic signal and a dedicated reference signal, comprising:

receiving a quality metric from a remote station, wherein the quality metric indicates the quality of a signal transmitted from the base station in a common reference signal and received by the remote station;

using the quality metric to adaptively allocate a fixed amount of power_between the traffic signal and the dedicated reference signal to maximize the capacity for transmitting the traffic signal to the remote station; and

transmitting the dedicated reference signal and the traffic signal to the remote station,

wherein the received common reference signal and the received dedicated reference signal are used to train a receiver at the remote station.

36. In a remote station, a method for facilitating adaptive allocation of at least one resource between a traffic signal and a dedicated reference signal, comprising:

receiving a common reference signal, a dedicated reference signal, and a traffic signal from a base station;

determining a quality metric of the received common reference signal;

transmitting the quality metric to the base station, wherein the base station uses the quality metric to adaptively allocate a fixed amount of power between the dedicated reference signal and the traffic signal to maximize the capacity for transmitting the traffic signal to the remote station; and

using the received common reference signal and the received dedicated reference signal to train a receiver at the remote station.

EVIDENCE APPENDIX

NONE.

RELATED PROCEEDINGS APPENDIX

NONE.